Resources Policy
49 (2016) 165-178
(Subject to minor amendments & formatting)

SPACE: The race for mineral rights

'*The sky is no longer the limit*'[1]

Lessons from earth!

By Sarah Jane Fox

1. INTRODUCTION

Law is rarely pro-active, but nevertheless, it is dynamic, needing to reflect the changing requirements of society. Transportation and property law is inherently built upon reaction and observed needs. When transport, and the movement of people and property, involves the crossing of boundaries and borders, the situation becomes even more involved and contentious. History has clearly shown that discord occurs when nations stake claims of ownership on disputed land or property outside 'recognized' state territory. It is often at this point that international law and treaties are turned to. But international law is acknowledged to be multifarious and complex. It is often a case of governance and ultimately power and control. In reality, States decide whether or not to enter into international treaties under the international custom, which is then accepted as 'law,' but inevitably this application and adherence remains subject to the political will of States and the protectionism of governments.

Ownership of the skies has remained an antagonistic issue for nations, with the 1900's seeing the establishment of air law, which was based on the concept of Laws of the Sea. Transport continues to develop and evolve due to society's needs and mankind's thirst for travel - transport remains a means to connect and access opportunities, and therefore trade and commercialization is inextricably linked.

The 1960's heralded the *new* stage with the emergence of a *new* era – travel into space. 12 April 1961 will be remembered forever as the day man journeyed into outer space. The space race had begun. This was to be between the then two superpowers, the U.S. and the Soviet Union. Technically, to be accurate, history records the start of the space-war some ten years earlier, in the 1950's. However this day was to mark the increase of competition involving human space exploration, which led, shortly afterwards, to President John F. Kennedy making the bold, public statement that the U.S. would land a man on the moon before the end of that decade. In essence, the race

[1] Richard Nixon: 1913-1994, Thirty-seventh President of the USA. "*Remarks at a Dinner in Los Angeles Honoring the Apollo 11 Astronauts.*" *Century Plaza Hotel, Los Angeles.* 13 August 1969.

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involved technological dominance and a race for supremacy. Space was viewed as a new frontier to conquer.

At the start of the second decade in the 'new millennium' an announcement was made that space landings and exploration were entering a new phase with 'Mars One' planning to establish a human settlement on Mars in 2027.[2] And, half way through the second decade the space race seemed to be entering a new battle too, with Russia declaring that it was planning to conquer Mars first, with a settlement which is scheduled to be launched in 2017.[3]

Mars One however, typifies the new breed of pioneers in so much as it non-governmental and has international representation – it is very much geared as the 'next giant leap for mankind' both in terms of reaching new outer space limits and levels of cooperation.

However, an apolitical approach to space and space exploration can far from said to be the norm with countries appreciating and no doubt envying the untapped value that lies above us all. And in 2015 the U.S. proactively staked a claim to this potential by laying a Bill before U.S. Congress on commercial space mining – property ownership was potentially set to reach new heights.[4] Arguably this action was to indicate the next phase of globalization an expansion out of Earth's orbit into '*asterization*,' albeit potentially of a monopolistic nature, whilst calling into question – mankind's rights vs. profit and commercialization.

This paper explores both the Bill and subsequent Space Resource Exploration and Utilization Act (as within the 2015 - U.S. Commercial Space Launch Competitiveness Act), whilst firstly undertaking a comparison analysis of other UN Treaties and Conventions. The research considers the aspect of sovereignty, boundary limitations and governance, whilst the validity of State commercialization of assets deemed as being '*mankind's heritage*' is therefore also subsequently analyzed. Both (i) the comparison analysis of UN Treaties and Conventions and (ii) the relevance of sovereignty/staking claims to assets should be viewed as primary objectives of the research. Ultimately, the methodology is related to legal research, whereby commentary is provided on the similarities of lessons learnt from Earth and other UN International (Space) Treaties and Conventions. Correlation-references are made in respect to this aspect and particularly to the current situation in the South China Sea. In doing so, the paper illustrates the U.S.'s reluctance to ratify any UN treaty, which

[2] In 2011 Bas Lansdrop and Arno Wielders laid the foundations for the Mars One mission. http://mars-one.com
The first spacecraft to journey to Mars from the Earth was NASA's 'Mariner 4,'which was launched on 28 November 1964 – arriving on 14 July, 1965.

[3] Initially announced early in the 1980's, the story re-surfaced and gained momentum in October 2015 being reported in newspapers across the world (e.g. see the Metro news – 28 October, 2015). The colonization would be a settlement of monkeys:
http://www.express.co.uk/news/science/615051/Russia-beat-US-Mars-trained-monkeys-space-race-mission-red-planet. The program launched in the 1980's and is being carried out at the Institute of Biomedical Problems, based at the Russian Academy of Science.
Also see: http://www.cnn.com/2015/11/04/asia/china-mars-probe-2020/

[4] HR 1508 - Space Resource Exploration and Utilization Act of 2015

does not allow the freedom …. of its *competitive advantage*: as is ultimately the aim of the Space Resource Exploration and Utilization Act.

2. Contextualisation – literature overview

2.1. The movement of man – boundaries and borders

As Steinberg made reference to, theorists within the geopolitics environment increasingly recognize that boundaries are more than simply lines that outline territories.[5] Whilst this is arguably true, there is also the additional related factor perhaps to consider, that, therefore, the act of movement has had an influential role to play in causing boundaries themselves to be defined or re-defined. Rubenstein remarked, that 'the function of a boundary is to produce and regulate a distinction between inside and outside; the movement of things across a boundary signals not its failure but its success.'[6] However, it is debatably whether claiming ownership of space, and particularly minerals, is ever going to translate to being successful for mankind. The truer potential is that space mining will, in the short-term at least, lead to conflict and discourse. When viewed from an economic and opportunistic perspective, it may be said to be however of economic benefit to a nation and particularly, that nation's position in an ever global world – where a nation strives to be ultimately 'the global superpower.'

It is true that man has always been migratory with an ancestry steeped in discovery - conquering nations and claiming land and ownership;[7] and of course, transportation has had a key role to play in advancing both movement and development. It is said that the discovery of new lands, which have then been governed and claimed mostly on behalf of sovereign nations, was initially facilitated by utilization of the seas.[8] In this way Steinberg makes the linkage between 'the ocean itself as a space of connection and an arena of mobility.'[9] Hence there is a direct correlation between a 'boundable space'/territory and the utilization of the area as a means of travel as well as to conquer and to claim.[10] Crossing boundaries has often been seen as an act of aggression and subsequently led to retaliation, and, hence, resulted in conflict and

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[5] Philip E. Steinberg (2009) Sovereignty, Territory and the Mapping of Mobility: A view from the Outside, *Annals of the Association of American Geographers*, 99:3 467-495.

[6] Steven Rubenstein (2001) Colonialism, the Shaur Federation, and the Ecuadorian state. *Environment and Planning D: Society & Space*. 19:263-93

[7] Paul Carter (1987) *The road to Botany Bay.* London: Faber & Faber.

[8] John Horace Parry (1974) *The discovery of the sea.* New York: Dial

E. Biagini and B. Hoyle (1999) Insularity and development on an oceanic planet. In *Insularity and development: International perspectives on islands*, ed. E. Biagini and B. Hoyle, 1-14. London: Pinter.

Thomas Bender (2006) *A nation among nations: America's place in world history.* Boston: Hill& Wang.

[9] Steven Rubenstein (2001) Colonialism, the Shuar Federation, and the Ecuadorian state. *Environment and Planning D: Society & Space*. 19:263-93.

[10] Jerry Brotton (1998) *Trading territories: Mapping the early modern world.* Ithaca, NY: Cornell University Press.

Philip Steinberg (1999) The maritime mystique*:* Sustainable development, capital mobility and nostalgia in the world ocean. *Environment and Planning D: Society & Space.* 17:403-26

J. R. Gillis (2007) Islands in the making of an Atlantic Oceania, 1500-1800. In *Seascapes: Maritime histories, littoral cultures, and transoceanic exchanges,* ed J. H. Bentley, R. Bridenthal, and K. Wigen, 21-37. Nonolulo: University of Hawai'i Press

physical wars. Whilst Chilton[11] further identifies that the era of the Cold War was a containment of suspicion (held within the USSR boundary and arguably the U.S. internal borders) - in terms of a perceived threatening environment which had the potential to manifest through outward aggressive actions. Nevertheless, this same distrust ultimately led to competitive behavior and the determination to exert a show of force and supremacy in other ways – such as 'conquering' what lies above us (the moon and the race to into space). Intertwined in this complex equation is invariably 'politics,' which manifests itself strongly in the form of sovereignty and ownership, and, hence, prosperity and dominance.

Clifford and Rubenstein actually point to the fact that mankind recognizes a border and boundary only when it is actually crossed[12] - in this sense, the phrases to 'cross the line' or 'overstep bounds or borders' are often used to show our distaste and dislike for an action. As the Cambridge Dictionary defines, crossing the line relates to an action or behavior 'that is not socially acceptable.'[13] And hence, there is further interconnect, in the sense of politics, which leads to policies and legislative control; and, ultimately, enforcement when such physical acts are perpetrated. Consequently, whilst mankind strives to prosper and to lead, it also needs to be reined in and controlled – and held accountable for subsequent actions. From this perspective there is a legal order - rules that can be expressed through different instruments, known as sources of law. These instruments/sources of the law are applicable in the relevant territory, from which they originated – which is termed national or federal law. It is only when International Law, in the form of treaties and conventions (or in the case of regional supranational organizations - such as the EU[14]) implement a direction or a restriction, or action for normative behavior, that the rule of law extends beyond an individual sovereign nation. Furthermore, it only becomes applicable to a contracting State and whilst States maybe signatories to an organization, they do not necessarily sign, ratify and implement all subsequent agreements. Simplistically viewed, nations need to consent to agree to be bound by a rule of law, which extends outside (or within) its territory. Somewhat ironically, there first needs to be the creation of a body which itself has jurisdiction to act on behalf of nations – therefore, this leads to creating boundaries and borders from an administrative perspective, so as to act within the intended aims. One such international organization is the United Nations (UN) founded towards the end of Word War II, the primary aims[15] relate to maintaining peace and security, taking collective measures so as to prevent and

[11] P. A. Chilton (1996). *Security metaphors: Cold war discourse from containment to common house.* New York: Peter Lang.
[12] J. Clifford (1997) *Routes: Travel and translation in the late twentieth century.* Cambridge, MA: Harvard University Press
Steven Rubenstein (2001) Colonialism, the Shaur Federation, and the Ecuadorian state. *Environment and Planning D: Society & Space*. 19:263-93.
[13] Cambridge Dictionary online: accessed 12 January, 2016
http://dictionary.cambridge.org/us/dictionary/english/cross-the-line
[14] 'The Member States of the European Union have agreed, as a result of their membership of the EU, to transfer some of their powers to the EU institutions in specified policy areas. Thus, EU institutions make supranational binding decisions in their legislative and executive procedures, budgetary procedures, appointment procedures and quasi-constitutional procedures.'
http://www.europarl.europa.eu/atyourservice/en/displayFtu.html?ftuId=FTU_1.4.1.html
[15] Article 1 of the United Nations Charter. http://www.un.org/en/sections/un-charter/chapter-i/index.html Signed 26 June, 1945 (San Francisco, US.)

remove threats to peace, whilst developing relations amongst nations based upon equal rights and international co-operation (for economic, social and humanitarian reasons). The UN is the center for harmonizing individual nations actions for the attainment of these common goals. In 1948 an international conference in Geneva adopted a convention formally establishing the International Maritime Office (IMO).[16] The UN later created an autonomous organization for the governance of international civil aviation, which logically transpired before the establishment of the Office for Outer Space Affairs.[17] The mere existence of these three agencies emphasizes the potential disputes that could arise in relation to the sea, the air and space. And this has been particularly true in respect to the seas that surrounds countries and continents. In this way, certainly for space, there are lessons to be learnt from the sea and the air (lessons from earth). Schmitt[18] offers that the division of the world into the fundamental elements of land and sea is actually the basis for the modern socio-spatial order; and yet, perhaps, this fails also to recognize the significance of air and space, (the latter taken to mean that which extends beyond our world). Evermore space is, and will continue to become, in the same way the ocean was to our sea-faring ancestors, both a means to travel and the method to acquire new possessions (be this, the acquirement of space territory or the gaining and trading of space-resources). Thomson[19] and Steinberg[20] provide the rationale that the nineteenth and twentieth centuries marked the dominance of the oceans as external borders from which the sovereign nations within constructed and secured their territorial land boundaries, whilst continuing to affirm their nations rights and entitlements to the seas. In many ways, space should be seen as a continuum of this rational. In 2002, The Walker Commission[21] stated, that rather than being sea-faring – '[n]ations aspiring to global leadership in the 21 century must be space-faring. Freedom, mobility, ….. the ability to do the difficult things that define leadership will be enhanced and discovered on the space frontier.'

3. Historical origins of space competition:[22] *key events*

On 4 October 1957 'Spunik,' the Russian for 'traveller,' was launched by an intercontinental ballistic missile, by the USSR. This was to be the first man-made object to enter into the Earth's orbit. The distrust between the U.S. and the Soviet Union was inevitably to lead to the space race; and, a year later, in 1958, the U.S. was to launch its own satellite, Explorer I. The year also marked the establishment of the National Aeronautics and Space Administration (NASA), a federal agency dedicated

[16] The original name was the Inter-Governmental Maritime Consultative Organization, or IMCO, but the name was changed in 1982 to IMO.
[17] Established by the General Assembly in its resolution 1348 (XIII) of 13 December 1958.
[18] C. Schmitt (2006) *Political theology: Four chapters on the concept of sovereignty.* Chicago: University of Chicago Press. C. Schmitt (2006) *The nomos of the Earth in the international law of the Jus Publicum Europaeum.* New York: Telos.
[19] J. E. Thomson (1994) *Mercenaries, pirates and sovereigns: State-building and extraterritorial violence in early modern Europe.* Princeton, NJ: Princeton University Press.
[20] Philip Steinberg (2001) *The social construction of the ocean.* Cambridge, UK: Cambridge University Press.
[21] Final Report of the Commission on the Future of the United States Aerospace Industry http://trade.gov/static/aero_rpt_aero_commission.pdf (2002)
[22] Courtesy of NASA - NASA history and space race. http://www.nasa.gov/index.html

to space exploration. Given the suspicion on the two mighty powers, the space-race was also linked to security and the exploitation of space for military dominance.

In 1959 the Soviet Union launched Luna 2, the first space probe to hit the moon. And then, in 1961, Yuri Gagarin, was to become the first man to journey into outer space, in his spacecraft 'Vostok,' which completely orbited the Earth on 12 April, 1961. A matter of weeks later the U.S. astronaut Alan Shepard became the first American in space. This led to President Kennedy declaring before a joint session of Congress (May 25, 1961)

> '…. I believe that *this nation* should commit itself to achieving the goal, before this decade is out, of landing a man on the moon and returning him safely to the Earth.'

Dominance of space was to be a competitive battle – and this declaration marked round one.[23]

3.1. Round one – the battle for space supremacy

Within a year, John Glenn became the first American to orbit the Earth (February 1962). Then, in December 1968, Apollo 8 became the first manned space mission to orbit the moon. And less than a year later, in July 1969, U.S. astronauts Neil Armstrong, Edwin "Buzz" Aldrin and Michael Collins set off on the Apollo 11 space mission. This was to result in the first lunar landing and see Armstrong becoming the first man to walk on the moon's surface. The U.S. had achieved Kennedy's aim.

3.1.1. The result

A race is defined as '*a competition between runners, horses, vehicles, boats, etc., to see which is the fastest in covering a set course*.' And, '*[a] situation in which individuals or groups compete to be first to achieve a particular objective.*'[24] In the space race there was a relative course set, but there was definitely a clear objective set by the U.S. by President Kennedy, and the means of transport that provided the movement – was to be a new type of space vehicle/vessel. Inevitably a competition also involves a winner and a loser, and in this regard history is divided as to which nation ultimately can claim this accolade. According to some views, '[b]y landing on the moon, the United States effectively "***won***" ***the space race*** that had begun with Sputnik's launch in 1957.'[25] Whilst the counter-argument is provided that when 'Neil Armstrong stepped onto the moon in 1969, America went down in popular history as the winner of the space race. But that history is bunk. The real pioneers of space exploration were the Soviet cosmonauts.'[26]

Whatever the view, probably the most accurate remark was made by Armstrong himself when he walked on the moon and described the consequences of the event as,

[23] J. M. Logsdon. *The decision to got to the moon: Project Apollo and national interests.* 1970. University of Chicago Press; R. D. Launius. *Nasa: A history of the U.S. civil space program.*
[24] Oxford Dictionary definition: http://www.oxforddictionaries.com/us/definition/american_english/race
[25] http://www.history.com/topics/space-race
[26] BBC documentary: Cosmonauts: How Russia Won the Space Race. http://www.bbc.co.uk/programmes/b04lcxms (last shown, Tue 29 Sep 2015)

'*one small step for man, one giant leap for mankind*,' although that said, he did place the U.S. flag prominently on the moon – as a tribute to the achievement (of the United States). Arguably, in hindsight, this could be viewed as marking the start of round two.

In a celebratory dinner in 1969, the Apollo 11 astronauts publically reinforced that there were no losers, just winners when they reiterated that the walking on the moon, was an achievement 'for all mankind.' President Nixon's response stated, 'thank you for raising our sights, the sights of men and women throughout the world to a new dimension-*the sky is no longer the limit*.'[27]

4. Staking claim to mineral rights

Law and legislation tends to be reactive rather than pro-active and this is particularly true in terms of space law…… *that is perhaps, until 2015* - with regards to space exploration or *exploitation* (relating to mining) when the U.S. took an unprecedented step in staking it's claim to arguably mankind's heritage. Debatably, this could be viewed as the start of round two of the space war!

4.1. Round two - The U.S. - Space Resource Exploration and Utilization Bill of 2015
On 19 March 2015 the Space Resource Exploration and Utilization Bill (SREU) was introduced for referral before the House of Representatives. The Bill was sponsored by Bill Posey a Republican Representative, and the aim was to approve the facilitation of commercial exploration and utilization of space resources to meet '*the nations needs*.' In many ways this should be seen as an obvious factor, since it is a U.S. Bill, but that said, the controversy lies in the very fact that any nation should bring a Bill before a national legislator concerning mining of any space asset, given the fact that 'space' extends beyond national jurisdiction.

The intention was that amendments to facilitate the Act would be accomplished by amending Subtitle V of title 51, United States Code, by adding at the end the following new chapter: Chapter 513 - Space Resource Exploration And Utilization.

The passage of the Bill saw an amended version being reported to the House, on 15 June, 2015 in which it directed the President, acting through appropriate federal agencies, to;

(1) facilitate the commercial exploration and utilization of space resources to meet national needs;
(2) discourage government barriers to the development of economically viable, safe, and stable industries for the exploration and utilization of space resources in manners consistent with the existing international obligations of the United States; and
(3) promote the right of U.S. commercial entities to explore outer space and utilize space resources, in accordance with such obligations, free from harmful

[27] Richard Nixon: 1913-1994, Thirty-seventh President of the USA. "*Remarks at a Dinner in Los Angeles Honoring the Apollo 11 Astronauts.*" *Century Plaza Hotel, Los Angeles.* 13 August 1969.

interference, and to transfer or sell such resources.'[28]

These aims were, by the very nature of such, controversial, for whereas the UN Treaties, for example Laws of the Sea and other Space Act provisions, speak of such resources being available to benefit all mankind, the (SREU) Bill clearly focused on space exploration as a means to benefit the U.S. The selling of acquired resources where ownership remains arguably contested is highly contentious; yet, the phrasing of the Bill clearly showed the assumption of rights and an entitlement to undertake commercial activities on asteroids and celestial bodies, where debatably the U.S does not have sovereignty of, and, furthermore, likewise the right to claim ownership of property.

Given past events, it is questionable how the international community would view such a capitalist approach in 2016 and beyond. However, insight can perhaps be gained by exploring previous experiences and related events further, as, in many ways, the then 'proposed' Act reflected the stance and demands of the U.S. in relation to deep seabed mining and the desire to see this activity commercialized through 'business' operations led from within the U.S. A commercial venture obviously alleviates the need of the U.S. Government solely having to foot the bill, whilst also sharing the risk associated with the lucrative pursuit of mineral exploration. That said, there is little doubt that the U.S. government would nicely profit by such commercial activities in space. Hence, the essential point remains as to whether it is acceptable or ethical for one nation to assume that it is 'entitled' to profit out of mankind's inheritance. In this way there are clear parallels and lessons to be drawn from lessons relating, not only to the sea, but the use of airspace and previous international space agreements.

5. Re-active international law – *sea and air – lessons from earth*

Medieval Roman law perhaps was fortuitous in developing the concept of air law insomuch as the Latin phrase '*Cuius est solum, eius est usque ad caelum et ad inferos*' – (which means whoever owns the soil, has rights up to Heaven and down to Hell) anticipated property ownership issues.[29] Yet, as mankind advanced, this concept was challenged and none more so that in respect to ownership of the skies and air rights, and therefore the use of airspace, used by the new breed of aviators. The development of air law was built upon the concept of Freedom of the Seas and even in this regards there remains a degree of friction as to the extension of territorial waters and 'rights' of a nation.

5.1. Historical implications - Laws of the Sea & Air: sovereignty claims!

The current international law of the sea is codified in the United Nations Convention on the Law of the Sea (UNCLOS),[30] whilst the Conventional on International Civil

[28] Section 2: HR 1508 - Space Resource Exploration and Utilization Act of 2015.
[29] Accredited to the 13th century glossator Accursius.
[30] Signed on 10 December 1982 in Montego Bay Jamaica, entering into force on 16 November 1994. UN Treaty Series, Volume 1833, p.3.

Aviation is the primary source of public international air law.[31] The latter is commonly referred to as the 'Chicago Convention' due to the origins of the Convention. Some commentators have viewed it as 'monumental piece of international law-making drafted with great foresight,'[32] however, it could be viewed as merely being responsive to the needs of the time and adhering to a legacy of distrust of nations,' where nations cling relentlessly to their sovereign claims and dominance.[33]

The important Articles to particularly identify are, in terms of the Chicago Convention:
Article 1, which 'recognizes that every State has complete and exclusive sovereignty over the airspace above its territory.'
In many ways this has similarities to the Roman Law with regards to ownership showing the sovereign jurisdiction of nations in claiming the skies.
Article 2, clarifies the legal status with regards to territory of a State, namely of the 'land areas and territorial waters adjacent thereto under the Sovereignty, suzerainty, protection or mandate of such State.'

The Chicago Convention is therefore based upon the uncodified customary law of the sea as it existed in 1944 and it is within the international law of the seas where a definition of 'territorial waters.' Article 2 (UNCLOS) further explains that the territorial sea includes its bed and subsoil.

Initially territorial waters were traditionally recognized to be three nautical miles from the coastline, however some nations disputed this and have made demands up to 200 miles in order mostly to protect fishing interests and other 'rights.' The solution was provided through the creation of a special area for economic interests, which UNCLOS recognizes within the Exclusive Economic Zone (EEZ) which is up to the 200 miles, whilst the breadth of the territorial sea of nations remains up to a limit not exceeding twelve nautical miles.[34]

Unlike UNCLOS, the Chicago Convention does not grant rights of innocent passage to foreign aircraft, which is extended under UNCLOS to all foreign ships, including the military. In many ways this reinforces the fact that aviation and the skies are more closely guarded and protected by nations than seas. Perhaps that is to be expected since some nations are landlocked, and since, arguably, the vulnerability is seen to be limited to a certain 'border' in terms of invasion or attack from the water (unless an island nation); whereas, the skies have shown the easy accessibility and, therefore, susceptibility of all nations and all areas.

Whilst clarity exists in respect to being able to define the territory of the State, in terms of land and sea, the polar regions proved a little more contentious and disputed

[31] Convention on International Civil Aviation, opened for signature 7 Dec. 1944. 61 Stat. 1180, 15 U.N.T.S. 295 (entered into force 7 April 1947) – Chicago.
[32] Michael Milde. Essential air & space law (2nd ed.). (2012) The Hague, Netherlands: Eleven International Publishing.
[33] Sarah J. Fox. (2014) The evolution of aviation in times of war and peace: blood, tears, and salvation. *International Journal On World Peace* Vol. XXXI No. 4 December 2014, pp. 49-79.
[34] Article 13 UNCLOS.

– since they are frozen areas, with the North Pole being a mass of floating ice. There have been various claims to ownership of the Arctic regions, which in many ways typifies perhaps the current attempt by the U.S. to stake a claim to asteroids and other celestial bodies, or the right to mine in an area rich in mineral wealth. This is particularly similar to the Antarctic area where nations have staked a claim to various segments. The Antarctic Treaty,[35] signed in 1959, was introduced with the purpose of stating that Antarctica shall be used for peaceful purposes only (Art. I), allowing freedom for scientific investigation and cooperation for that purpose (Art. II) and with scientific observations and results from Antarctica being freely exchanged and made available (Art. III). It was said, as within the Preamble, to be in the 'interest of all mankind' that Antarctica should be forever used exclusively for peaceful purposes 'and '*shall not*' become the scene or object of international discord.' That said, the legal situation of nations staking claims to various segments of the Antarctic areas is not specifically clarified by the Treaty, with various authorities claiming that Antarctica as a territory remains '*undetermined*' in terms of sovereignty, much in the same way as the high seas also are.[36]

The original signatories of the Antarctic Treaty were - Argentina, Australia, Chile, France, New Zealand, Norway and the United Kingdom – each staking a territorial claim, some of which overlapped; whilst, the U.S. and Russia maintain a "basis of claim."[37] Officially, the Treaty states that all positions are explicitly protected (Article IV), which preserves the *status quo*, namely in advocating that,

> *'No acts or activities taking place while the present Treaty is in force shall constitute a basis for asserting, supporting or denying a claim to territorial sovereignty in Antarctica or create any rights of sovereignty in Antarctica. No new claim, or enlargement of an existing claim to territorial sovereignty in Antarctica shall be asserted while the present Treaty is in force.'*

The total number of Parties to the Treaty however now only remains at 53, which is considerably low (compared, for example with the number of Contracting States to the Chicago Convention – which currently is 191) and thus arguably, this would not prevent a non-signatory nation from claiming ownership and sovereignty rights.

In many ways the same uncertainty still exists in terms of airspace and the height that this extends to. The vertical limit has not been specified within International treaties and conventions and the delimitation of airspace and outer space is still unclear. There are no disputes registered on this issue and until this occurs or until legislation becomes pro-active this is likely to remain unresolved. Milde[38] offers that a pragmatist would state that this has no practical relevance 'at present,' but arguably, in response, it is stated that this needs to be considered in view of the fact that

[35] Antarctic Treaty, signed on 1 December 1959, entering into force in 1961. http://www.ats.aq/e/ats.htm

[36] Michael Milde. Essential air & space law (2nd ed.). (2012) The Hague, Netherlands: Eleven International Publishing.

[37] Both the United States and the Soviet Union did not recognize the claims of other governments and reserved the right to assert claims.
http://www.state.gov/t/avc/trty/193967.htm

[38] Michael Milde. Essential air & space law (2nd ed.). (2012) The Hague, Netherlands: Eleven International Publishing.

subsequent treaties have failed to address such contentious matters that inevitable 'will & do' arise.

The International Civil Aviation Organization (ICAO) came into being in 1947 as part of the Chicago Convention, however it was not until 1990 that ICAO adopted airspace designations, which saw the U.S. '*basing*' their system on the same classification system.[39] However, that said, there remain many differences across the world, including with different definitions and also different heights associated with each designated area.

The phrase 'the edge of space'[40] is often used to mark the ending of airspace and the beginning of outer space and is based upon the work of Theodore von Kármán[41] which the Kármán line is named after.[42] This lies at an altitude of 100 kilometers (62 mi) above the Earth's sea level, and is said to be the boundary between the Earth's atmosphere and outer space. This definition is recognized by the Fédération Aéronautique Internationale (FAI).[43] However any suggested definition remains merely a benchmark in lieu of international agreement.[44] And, that said, when the height increases it invariably remains questionable as to what can actually be claimed under sovereign ownership, since arguably, as the earth rotates, the airspace above a country is only relative - meaning there is no fixed point above it for which to claim sovereignty over.

The airspace over the High Seas is loosely referred to in UNCLOS. Part VII defines the High Sea provisions and Article 59 says that no State '*may validly purport to subject any part of the high seas to its sovereignty*.'

And, in 1970, after extensive years of discussions, the UN Assembly unanimously declared the seabed and ocean floor were beyond the limits of national jurisdiction and held it to be the common heritage of mankind.

The preamble to UNCLOS reinforces this by stating;

> '*Desiring by this Convention to develop the principles embodied in resolution 2749 (XXV) of 17 December 1970 in which the General Assembly of the United Nations solemnly declared inter alia that the area of the seabed and ocean floor and the subsoil thereof,* ***beyond the limits of national jurisdiction****, as well as* ***its resources, are the common heritage of mankind****, the exploration and exploitation of which shall be carried out for the benefit of mankind as a whole, irrespective of the geographical location of States.*'

[39] https://www.faa.gov/regulations_policies/handbooks_manuals/aviation/pilot_handbook/media/PHAK%20-%20Chapter%2014.pdf
[40] A long over due tribute to an elite group of Dryden research pilots. http://www.nasa.gov/centers/dryden/news/X-Press/stories/2005/102105_Wings.html
[41] A Hungarian physicist and engineer.
[42] See further details on the Kármán line at http://www.fai.org/icare-records/100km-altitude-boundary-for-astronautics
[43] http://www.fai.org/icare-about-us
[44] B. Jasani (ed.), *Outer Space: A Source of Conflict or Cooperation?* United Nations University Press, Tokyo, 1991, pp.7-8.

UNCLOS reinforces the common heritage both of the sea and the resources found within it. In fact the Treaty reinforces many of the aspects identified in 1917 by the U.S. President, Woodrow Wilson, in his *'Peace without Victory'* speech to Congress.[45]

Within the speech Wilson reinforced both the significance of travel and equality.[46]

- Firstly, he stated that, "[t]he equality of nations upon which peace must be founded if it is to last must be an equality of rights." In doing so he referred specifically to the sea.

- Secondly, he reinforced his belief that, "the paths of the sea must alike in law and in fact be free. The freedom of the seas is the sine qua non of *peace, equality, and cooperation.*"

- Then he referred to "a somewhat radical reconsideration of many of the rules of international practice hitherto thought to be established may be necessary in order to make the seas indeed free and common in practically all circumstances for the use of *mankind*...."

- And, he stated that there was compelling reasons for advocating and securing "the freedom of the seas", which could be achieved "*if the governments of the world sincerely desire[d] to come to an agreement concerning it.*"

Given this respect for mankind and the desire to create equality of access to the seas, it is perhaps, somewhat of an irony, that, despite the fact that there are 167 Contracting States to UNCLOS, the U.S. is not one of these.[47] (This number includes the EU, which is a signatory and member in its own right, unlike the Chicago Convention.) Although President Clinton signed the Convention in 1994, it has however, never been ratified by the U.S. Senate. The U.S., the world's superpower, is the only permanent member of the UN Security Council and the only NATO member that is not yet a party to UNCLOS. This remains somewhat of an absurdity, let alone controversial, particularly given the uncertainty in the South China Sea.[48] Support for ratifying UNCLOS lays both outside the U.S.[49] and within it. President Barack Obama has been vocal in his term in office in criticizing the U.S. Senate for its continued failure to ratify the Law of the Sea Convention and even the U.S. Navy

[45] W. Wilson (1917) *Peace without Victory Speech to Congress, 22 January 1917* [online] http://www.firstworldwar.com/source/peacewithoutvictory.htm
[46] For further discussions see Fox, S. J. (2015) 'CONTEST'ing Chicago. Origins and Reflections: *Lest we forget!* International Journal of Private Law, 2015, Vol. 8, No. 1, pp. 73-98
[47] See list of signatories – UN Treaty Collection https://treaties.un.org/pages/ViewDetailsIII.aspx?src=TREATY&mtdsg_no=XXI-6&chapter=21&Temp=mtdsg3&lang=en
[48] Stefanos Roulakis. South China Sea puts pressure on US to ratify UNCLOS, Maritime Trade Intelligence, 18 July, 2015.
[49] Raul Pedrozo, "A Response to Cartner's and Gold's Commentary on 'Is it Time for the United Stated to Join the Law of the Sea Convention?'" *Journal of Maritime Law and Commerce*, Vol.42, Iss.4, Oct 2011. pp. 487-510.

have advocated the merits of the Treaty and the need to sign it.[50]

In many ways the difficulties and issues encountered in the South China Sea is a possible indicator of the potential aspects to arise in outer space and the claiming of rights by individual nations, such as, with regards to mining entitlements.

The issues in the South China Sea are recognized to be particularly complex due to historical claims and rights, which at the moment is not the case with regards to outer space and historical sovereignty claims, which have yet to be pursued. However, this comparison should serve as an important lesson for the international community (and international law) which should recognize the need to be globally pro-active (rather than responsive to the stance taken by one nation). By exploring lessons from the sea it is possible to identify issues that will no doubt arise regarding outer space, and assets to be gained from outside the Earth. Not to do so indicates a failure to anticipate future issues and is an indicator that nations have not learnt from past conflicts.

5.1.1. South China Sea

In the case of the South China Sea the contested aspects relate to ownership of islands and State sovereignty, not so much of the land but the valuable minerals that are to be found in the sea.

- *Sovereignty* – As always perhaps, sovereignty and ownership entitlements remains the most contentious issue in the South China Sea dispute. Under UNCLOS, states have the right to construct artificial islands within their sovereignty, even within their EEZ. States also have the right to construct artificial islands on reefs or rocks that then are considered sovereign territory. Hence in the South China Sea there is significance in claiming ownership and sovereignty of islands, as has occurred by China, the Philippines, and Vietnam. Under UNCLOS this would extend their rights over the coverage of the sea from the island.
- *Status* – However, this would then lead-on to identifying the status of the claimed territory and whether it would then be called territorial sea. This is critical to determining the related rights. Although a man-made island can be built within the EEZ, it does not then extend the right to territorial sea status. Whereas, a rocky, uninhabitable island can give rise to a territorial sea claim and an exclusive economic zone.[51]

Whilst China is a contracting State to UNCLOS the U.S. states that it adheres to UNCLOS, whilst relying on customary international law. This is an interesting situation, as arguably the Contracting State, China, in this case, interprets certain parts of the Treaty differently, particularly in respect of the rights of creating man-made islands linked to disputed territory. The U.S. (a non-Contracting State) has an

[50] US Navy Judge Advocate General's Corp.
http://www.jag.navy.mil/organization/code_10_law_of_the_sea.htm

[51] UNCLOS - Signed on 10 December 1982 in Montego Bay Jamaica, entering into force on 16 November 1994. UN Treaty Series, Volume 1833, p.3
Also see the commentary of Stefanos Roulakis. South China Sea puts pressure on US to ratify UNCLOS, Maritime Trade Intelligence, 18 July, 2015.

increasing presence in the waters and says that it is frequently and increasingly being called upon by the other countries in the region to provide a security presence, against Chinese dominance and staking of claims.[52] Therefore, freedom of navigation in the region remains a contentious issue, especially between the United States, and the new superpower China, with China pointing to the fact that U.S. military ships are operating within China's EEZ. As these tensions continue to develop, the situation is heightened by the growth of China's military power and by regional claims to island groups. That said, the conflicts inevitably centers around claims to minerals, as is the case between China and the Philippines over natural gas deposits in the area of Reed Bank. There are also suggestions that the United Kingdom-based 'Forum Energy' plans to start drilling for gas in Reed Bank at the end of 2015 or early in 2016, which could lead to further antagonism in the region. Manila, a claimant of the islands, having offered exploration contracts to the energy group.[53]

As is evident, despite the fact that there is a United Nations Convention, there remain disputes regarding sovereignty and interpretation of the actual Treaty, with each claimant interpreting it in a manner that best suits its purpose, or choosing to disregards certain segments when they conflict with financial gains that can be made.

The first conference to discuss Law of the Sea (leading eventually to the current UNCLOS) actually occurred in 1973 and subsequent meetings took place for a period of nine years, so the actual Treaty was in itself a difficult course to navigate. The part that the United States contested related to Part XI, which concerns the deep seabed and the mining of valuable minerals – so there is perhaps even more irony that a Bill was brought before Congress concerning resource exploration and utilization of space in 2015[54] when the dispute in the South China Sea continues to linger on and when the U.S., to date, is still not a Contracting State to UNCLOS.

Specifically, Part XI relates to deep seabed mining outside any state's territorial waters or EEZ, and Article 133 clarifies that minerals covers all 'resources' and means all solid, liquid or gaseous mineral resources and includes polymetallic nodules.

Whilst, Article 137 relates to the Legal status of the Area and its resources, explaining that,

'1. No State shall claim or exercise sovereignty or sovereign rights over any part of the Area or its resources, nor shall any State or natural or juridical person appropriate any part thereof. No such claim or exercise of sovereignty or sovereign rights nor such appropriation shall be recognized.'

Article 140 develops this further adding emphasis to the principle of activities should be viewed as being for the 'benefit of mankind' specifically stating that

[52] U.S. Secretary of Defense, Ash Carter. 31 October 2015. http://www.cnbc.com/2015/11/01/ash-carter-says-china-island-building-pushing-asia-to-build-us-ties.html
[53] Bonnie S. Glaser, Armed Clash in the South China Sea, Contingency Planning Memorandum No. 14 (2015) http://www.cfr.org/world/armed-clash-south-china-sea/p27883
[54] HR 1508 - Space Resource Exploration and Utilization Act of 2015.

'1. Activities in the Area shall, ……. be carried out for the benefit of mankind as a whole, irrespective of the geographical location of States……'

'2. The Authority shall provide for ***the equitable sharing of financial and other economic benefits*** *derived from activities in the Area through any appropriate mechanism, on a non-discriminatory basis……..'*

The U.S. however objected to the provisions relating to mining and during the 10th Session of UNCLOS III the U.S. withdrew from the talks although they did later return just before the Convention was concluded. U.S. Assistant Secretary of State for Oceans and International Environment and Scientific Affairs Special Representative of the President for the Law of the Sea, James Malone, stated that '[t]he deep seabed mining provisions of the Draft Convention text were, however, unacceptable and clearly contrary to *vital U.S. interests*.'[55]

The U.S., upon returning to talks, were instructed to negotiate a Treaty that;

> - '*would not deter development of any deep seabed mineral resources to meet national and world demand;*
>
> - *would assure national access to these resources by current and future qualified entities to enhance U.S. security of supply, to avoid monopolization of the resources by the operating arm of the International Seabed Authority, and to promote the economic development of the resources;*
>
> - *would provide a decision-making role in the deep seabed regime that fairly reflected and effectively protected the political and economic interests and financial contributions of participating states;*
>
> - *would not allow for amendments to come into force without approval of the participating states, including in our case the advice and consent of the Senate:*
>
> - *would not set other undesirable precedents for international organizations; and,*
>
> - *would be likely to receive the advice and consent of the Senate. In this regard, the Convention should not contain provisions for the mandatory transfer of private technology and participation by, and funding for, national liberation movements.*[56]

This was perhaps clear evidence that the superpower was positioning its own interests before that of an international and globalized society; and it is therefore perhaps questionable now as to the stand and role of the U.S. in respect to the South China Sea, namely, whether its presence there is as a peace keeper, or whether there are underlying motives with regards to access and extraction of the valuable minerals that

[55] James L. Malone. The United States and Law of the Sea after UNCLOS III. Law and Contemporary Problems. 1983.Vol 46. No 2.
[56] Statement by the President, 18 WEEKLY COMP. PRES. D3c:. 94 (Jan. 29, 1982).

lie beneath the seas. This is given more credence perhaps with regards to the historical stance taken by the U.S with regards to the proposal put forward during the talks on the Convention for Law of the Seas. The U.S. particularly resented not having the opportunity for private investment in deep seabed mining, with The American Mining Congress referring to the U.S. Public Law that provided 'a satisfactory investment climate'[57] under the Deep Seabed Hard Mineral Resources Act.[58]

However, UNCLOS did lead to the establishment of the International Seabed Authority (ISA)[59] and, in this respect, the U.S. argued that this was merely an indicator of bureaucratic control, whilst the Convention was equally not market friendly, which arguably was another way of saying that powerful nations could not exploit mining due to their wealth – which is the category the U.S. clearly was in. The U.S., in other words, objected to this redistribution of wealth mechanism which the ISA provided, stating that the Convention created a New International Economic Order.

ISA requires nations interested in mining to provide wealth back to ISA along with the development of mining technology for a set period of time. There are also royalty rights and a processing fee, which the U.S has voiced concerns over. The U.S. has indicated its deep concern about the inherent dangers of legitimizing a socialist concept by signing the UNLOS Treaty, and Malone, speaking in his position as representative of the U.S. shortly after UNCLOS III was concluded, even raised the point that there was a risk that such an approach could even be applied in other areas such as the Antarctic and outer space.[60] So potentially, it should come of no surprise that a superpower capitalist nation, the U.S., put forward its own Space Resource Exploration and Utilization Bill, to counter-act the same reasoning being applied to subsequent outer space mining. However, the action by the U.S. invariable remains highly contestably, in terms of 'boundaries' - specifically (i) claiming something that no one has ever claimed before, such as an asteroid or the minerals found on a celestial body; (ii) the entitlement to claim such mined assets on behalf of one nation, or a company (from the outset, no doubt a monopolistic venture, albeit a potential alliance – but with limited competitors) and (iii) how this 'concept' stands up to external scrutiny, and will be viewed by the international community, which is inherently more inclined towards treating such 'asset's as benefits for the whole of mankind' and not a select few, where inevitably the national country would also take

[57] Law of the Sea: *Hearings Before the Subcomm. on Oceanography of the House Comm. on Merchant Marine and Fisheries*, 97th Cong., 1st and 2nd Sess. 330 (1981-82) (statement of Conrad G. Welling on behalf of the American Mining Congress).
[58] 30 U.S.C. § 1401 (Supp. IV 1980).
[59] 'The International Seabed Authority is an autonomous international organization established under the 1982 United Nations Convention on Law of the Sea and the 1994 Agreement relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea. The Authority is the organization through which States Parties to the Convention shall, in accordance with the regime for the seabed and ocean floor and subsoil thereof beyond the limits of national jurisdiction (the Area) established in Part XI and the Agreement, organize and control activities in the Area, particularly with a view to administering the resources of the Area.' https://www.isa.org.jm/mining-code
[60] James L. Malone. The United States and Law of the Sea after UNCLOS III. Law and Contemporary Problems. 1983.Vol 46. No 2.

a share in the acquired wealth.

Whilst the position of the U.S. is that it respects UNCLOS, commentators have indicated that the U.S. will always support the option that allowed it to mine the seabed. It is argued that it is open to interpretation as to whether UNCLOS has actually attained the status of customary international law; and, it also suggested that even if the provisions had attained such status, the regime 'would not apply to a state, such as the United States, that had rejected it and had insisted on its right to mine the deep sea-bed under present rules of customary international law.'[61]

It was no doubt the competitiveness of superpowers and the perception of American supremacy[62] in the 1960's in relation to space that lead to the international community developing treaties in relation to space law over what was proving to be another area of potential conflict.

6. Space Law Treaties and Principles – lessons from early space exploration

The UN Committee on the Peaceful Uses of Outer Space is the forum for the development of international space law. The use of outer space for peaceful purposes began in 1957 prior to the launching of any satellite in the Earth's orbit. The emphasis then was on prohibiting the use of space for military purposes and the placement of weapons of mass destruction in outer space.

To date, the Committee has concluded five international treaties[63] and five sets of principles on space-related activities. However, that said, the status of each of the respective treaties remains inconsistent (see Table 1).

The five treaties (commonly collectively referred to as the five United Nations treaties on outer space) are:

- The "Outer Space Treaty"[64] (OST) opened for signature on 27 January 1967, entered into force on 10 October 1967
- The "Rescue Agreement"[65] (RA) opened for signature on 22 April 1968, entered into force on 3 December 1968
- The "Liability Convention"[66] (LC) opened for signature on 29 March 1972, entered into force on 1 September 1972

[61] American Law Institute, *Restatement of the Law, Third, of the Foreign Relations Law of the United States*, Vol. 2 (St. Paul, MN: American Law Institute Publishers, 1987), § 523.
[62] Giles Scott-Smith and Moritz Baumgärtel New paradigms, old hierarchies? Problems and possibilities of US supremacy in a networked world. 2011, *International Politics* 48, pp.271-289
[63] In relation to this research, comment will be made specifically in relation to the first and last Treaties – namely the Outer Space Treaty and the Moon Agreement.
[64] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies. Adopted by the General Assembly in its resolution 2222 (XXI).
[65] Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space. Adopted by the General Assembly in its resolution 2345 (XXII).
[66] Convention on International Liability for Damage Caused by Space Objects. Adopted by the General Assembly in its resolution 2777 (XXVI).

- The "Registration Convention"[67] (RC) opened for signature on 14 January 1975, entered into force on 15 September 1976
- The "Moon Agreement" [68] (MA) opened for signature on 18 December 1979, entered into force on 11 July 1984.

TREATY	Ratification, acceptance, approval accession or succession	Total signature	Declaration of acceptance of rights and obligations
OST	103	25	0
RA	94	24	2
LC	92	21	3
RC	62	4	3
MA	16	4	0

Table 1: Status of International Agreements relating to activities in outer space as at 1 January 2015[69]

6.1. The Outer Space Treaty and the Moon Agreement

6.1.1. The OST

The OST was inspired by the 'great prospects opening up before mankind as a result of man's entry into outer space'[70] and was based upon the Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space, which had been adopted by the General Assembly in 1963.[71]

The full title of the (1966) OST is in fact, the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.[72]

Within the Preamble, four important factors are cited;

(i) The '*recognition'* that there is a common interest in exploring outer space, for '*peaceful'* purposes.

(ii) *The 'belief'* that exploration and use of outer space should be undertaken for the 'benefit of "all" peoples.' The "*all*" aspect is then reinforced with reference to the fact that this should be 'irrespective of the degree of their

[67] Convention on Registration of Objects Launched into Outer Space. Adopted by the General Assembly in its resolution 3235 (XXIX).
[68] Agreement Governing the Activities of States on the Moon and Other Celestial Bodies Adopted by the General Assembly in its resolution 34/68.
[69] Data from United Nations – Office for Outer Space Affairs [Accessed 26 September, 2015]. Ref: A/AC.105/C.2/2015/CRP.8
[70] Resolution Adopted by The General Assembly 1962 (XVIII), Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space.
[71] Ibid.
[72] The Treaty was opened for signature by the three depository Governments (the Russian Federation, the United Kingdom and the United States of America) in January 1967, and it entered into force in October 1967. Resolution 222 (XXI).

economic or scientific development.'

(iii) The '*desirability'* to contribute to international co-operation, which is stated to include scientific as well as legal aspects concerning the exploration and use of outer space – whereby the peaceful application is again reinforced.

(iv) It is further more stressed that there is the '*belief*' that only by cooperation will understanding of nations and friendship be achieved.

This reinforces the 1962 Declaration, which stated, within the principles relating to the exploration and use of outer space States, that although outer space and celestial bodies are free for exploration and use by all States, this should be both in accordance with international law (including the Charter of the United Nations) and on an equality basis, adding that 'outer space and celestial bodies are not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.'[73]

It is stated that Contracting States take responsibility for compliance of the Treaty, and, in this respect, the depth of this responsibility is questionable. When activities are undertaken by government or national bodies then the assumption is that the State assumes responsibility as the signatory, and, if an activity is undertaken by an international body then that organization assumes the responsibility.[74] However, Article II specifically refers to sovereignty claims and in 1969 Professor Gorove[75] cast doubt on whether any claim by sovereignty related to private parties at all. That said, Sovereignty remains a nation's right to exert exclusive authority over people, and arguably therefore over resources and national bodies, etc., not only within the State, but at times external to it – particularly for example, the retention of jurisdiction at times for other transport modes (ships and aircraft). However, this interpretation will no doubt remain significant to determine, '*if*' private companies pursue mining on/from celestial bodies. That said the later MA does add further clarity, at least in respect to the moon.

As is to be expected, the Treaty replicates the Preamble and the 1962 Declaration, although in places it does appear very vague and arguably in need of some clarification or update. Since it is a UN Treaty the sentiments and ideals read similar to both UNCLOS and the Antarctic Treaty, certainly the clear message is based upon equality and cooperation and the benefiting of all mankind -'equally.'

The Treaty also prohibits the placement of nuclear weapons or any other kinds of weapons of mass destruction in outer space as well as the positioning of such weapons on celestial bodies. And it is this area where amendments have been

[73] Resolution Adopted by The General Assembly 1962 (XVIII), Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space.
[74] Title VI OST.
[75] Stephen Gorove. Interpreting Article II of the Outer Space Treaty, 37 *Fordham L. Rev*. 349, 1969, pp. 351.

proposed in particular with the concerns being directed towards a potential arms race.[76]

The OST provided no definition as to what outer space is classified, as, much in the same way that the Chicago Convention failed to define airspace. This has been raised at various times,[77] including in 2001 by the U.S.[78] In this instance the question arose due to equitable use of the geostationary orbit, and, on this occasion the following was stated,

> '*With respect to the question of the definition and delimitation of outer space, we have examined this issue carefully and have listened to the various statements delivered at this session. Our position continues to be that defining or delimiting outer space is not necessary. No legal or practical problems have arisen in the absence of such a definition. On the contrary, the differing legal regimes applicable in respect of airspace and outer space have operated well in their respective spheres. The lack of a definition or delimitation of outer space has not impeded the development of activities in either sphere.*'[79]

Consequently, on this occasion, it was said that there was not a need to define outer space and or to show the limits of such, as the U.S. was committed to the position 'that because this orbit, at approximately 36,000 kilometers above the earth, is in outer space, its use is governed by the 1967 Outer Space Treaty.' Reinforcement was then given to the fact that the OST provides in Article I that 'Outer space . . . shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law. . . .' Reference was also made to Article II whereby it was reiterated that 'outer space is not subject to national appropriation by claim of sovereignty or by any other means.' Thus, a signatory to this Treaty cannot 'appropriate a position in the GSO either by claim of sovereignty or by means of use, or even repeated use, of such an orbital position.'[80]

However, the view taken was that without a practical problem to address providing a definition would be '*a risky exercise*.'

The counter argument was that a definition was needed in order to 'safeguard the sovereignty of states. But, in this regard the reply given was that 'we are aware of no issue of state sovereignty that would be solved by defining outer space.' However, with the recent U.S. development,[81] specifically the SREU Bill brought before Congress concerning resource exploration and utilization of space in 2015, arguably

[76] Press Release: UN - GA/SPD/347 Potential outer space arms race, equitable access to space technologies among issues as fourth committee continues debate on peaceful uses of outer space. 12 October, 2006.
[77] Ogunsola O. Ogunbanwo '*International Law and Outer Space Activities'* 1975. Martinus Nijhoff – The Hague. (pages 50 through to 59).
[78] Digest of United States Practice in International Law 2001 » 85. U.S. Statement, Definition and Delimitation of Outer Space And The Character And Utilization Of The Geostationary Orbit, Legal Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space at its 40th Session in Vienna from April (2001).
[79] Ibid.
[80] Ibid.
[81] The HR 1508 Bill, later the Space Resource Exploration and Utilization Act of 2015.

there are grounds for advocating that more definition and clarity is required internationally, before nations start to apply their own terms, conditions and definitions, much in the same way as is occurring in the South China Sea. Certainly, at the end of 2015 with the implementation of the SREU Act – this appears to be more than a distinct possibility.

The earlier Committee, on discussing definition and boundaries for outer space, commented that there was risk in providing a definition for outer space, as technological advancements would no doubt lead to changes. It was also commented that it 'would be dangerous for the Legal Subcommittee to agree to an artificial line between air space and outer space, when it cannot predict the consequences of such a line.'[82]

The danger no doubt lies in the fact that Member States are able to claim sovereignty to airspace above their territory but that under OST outer space and celestial bodies are not subject to sovereign or national appropriation or claim. Whereas, a definition would result in a possible restriction for nations claiming sovereignty over something that is deemed to be within 'their airspace' (as opposed to outer space) – again much in the same way as is contracting states are claiming 'territories' or 'EEZ' in the sea.

The Treaty also failed to define celestial bodies and in this regard there has also been much debate and discussion over the lack of definitions.[83] Working Group Three of the International Institute of Space Law proposed a definition in 1964 for celestial bodies, which are 'those natural objects in outer space….. which cannot be artificially removed from their natural orbits.'[84] However, regarding this definition it has also been argued that the removal of an asteroid from an orbit around Earth for exploitation of its mineral resources should remain within the definition of a celestial body and the removal, or change of course of such, should not actually change what it is classed as – namely a celestial body.[85]

The defining of celestial bodies remains complicated by the physical conditions, composition (gas, liquid etc.,) size etc., of these entities – all of which have been suggested as possible methods to assist with providing a definition.[86] That said, this Treaty did not specifically address the mining of minerals.

6.1.2. The MA

[82] Digest of United States Practice in International Law 2001 » 85. U.S. Statement, Definition and Delimitation of Outer Space And The Character And Utilization Of The Geostationary Orbit, Legal Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space at its 40th Session in Vienna from April (2001).
[83] Gennady P. Zhukov, The Problem of the Definition of Outer Space. 1967. *10 Proc. Coll. L. Outer Sp. (PCLOS) 271.*
[84] Michael Smirnoff, Report of the Law of Outer Space. 1964. *7 Proc. Coll. L. Outer Sp. 352*
[85] Marian Nash Leich, ed. *Digest of United States Practice in International Law*. Washington, D.C., Office of the Legal Adviser, Department of State, 1980.
[86] E. Brooks. Natural Control of Natural Planetary Bodies: Preliminary Consideration. *32 Journal of Air Law and Commerce,* 1966, pp. 315. J Sztucki, Remarks During the Discussion on the Introductory Report, 9 *PCLOS* 64, 1966, p.64. S M Williams, Utilization of Meteorites and Celestial Products, 12 *PCLOS* 179, 1969, p.179.

The full name of the Moon Agreement is the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies and it reaffirms the main respects as found within the UN Treaty on Outer Space – namely, the need for 'international cooperation in the field of the exploration and peaceful uses of outer space, including the moon and other celestial bodies, and of promoting the rule of law.'[87] The Agreement therefore relates once more to the undefined 'celestial bodies' whilst being specific with regard to the 'moon.'

Article 3 reinforces that the moon is only to be used for peaceful purposes and again emphasizes that no weapons are to be placed in orbit, on the moon, in or around it and that the moon should not be used for military purposes.

It is once more stated that exploration should be for the benefit of all mankind and 'for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development.'[88]

Article 11 defines the limitation of the moon by stating, firstly that
'The moon and its natural resources are the common heritage of mankind, …..'
And continues at Article 11.2. that,
'The moon is not subject to national appropriation by any claim of sovereignty, by means of use or occupation, or by any other means.'
This second part clarified the position with regards to staking claim, for it should be recalled that the U.S. placed its flag on the moon some years earlier and in the historical sense this has often been seen as claiming ownership or sovereign rights. Certainly the 1957 article from the U.S. called 'Let's Claim the Moon - Now!' referred to the similarities of the act of planting the flag on the moon to that of Columbus claiming territory on behalf of a nation: '*Columbus stuck the Spanish Flag into the sands of a West Indies beach - and we or the Russians would be perfectly within the concept of international law to claim possession of the Moon…..*'[89]

And, Article 11.3. arguably also adds clarity on this matter, by stating,

> 'the surface nor the subsurface of the moon, nor any part thereof or *natural resources in place, shall become property* of any *State, international intergovernmental or non-governmental organization, national organization or non-governmental entity or of any natural person*.'

By some commentators this is interpreted that mining would not be permissible; however, the '*in place*' part, has resulted in some interpretations that once mined, the resource may become property and subject to ownership.[90] Meaning that it would no longer be in place and subject to this restriction. This seems to be wishful interpretation, but that said, there is nothing specifically in the Moon Agreement or OST to give reason to believe that mining on other celestial bodies per se is not

[87] Preamble to the Moon Agreement.
[88] Moon Agreement, Article 4.
[89] Huss. Let's Claim the Moon -- Now! Mechanix Illustrated, Feb. - Mar. 1957, at 7.2
[90] Cepelk and Gilmore. Application of General International Law in Outer Space, 36 *J. Air L. & Com.* 30, 1970 pp. 38-39.

permissible under either Treaty, however, the indications are, that if such was permissible, the property would become ownership of mankind. Even in this respect, property remains a contentious phrase, open to interpretation – as the MA discusses specifically 'appropriation' which would imply more of a wrong doing – treating something like you have a right to it. Inevitably interpretation of international conventions and treaties is subject to compatibility and understanding with national law and practices, which vary greatly across the globe.

There are many questions that are likely to arise in the future with regards to further space development and where clarity will be needed – not least, *when does exploration become mining*? (particularly, of a commercial nature); and, whilst specific reference was made to the moon and the need to avoid measures which would cause the disruption to the balance of the moon and the environment, the same clarity is not added in terms of celestial bodies.

Table 1, which shows the Status of International Agreements relating to both the OST and the MA, show only too clearly the stark difference in terms of signatories and ratification. This no doubt is related to the tighter wording in respect to the later agreement and the limitations with regards to the opportunity to claim ownership and inevitably also to mine.[91]

In terms of superpowers, whilst China, the US and the Russian Federation have all ratified the OST not one of them have even signed the MA. Arguably this should warn of future power struggles and claims, much in the same way has occurred in the South China Sea; at the very least, it should indicate an intention to further investigate opportunity for national gain. Maybe in this respect the U.S. is openly showing its hand in bringing a Space Exploration Bill to the forefront, which it was more than speedy in enacting a the end of 2015.

7. U.S. developments in Space Resource Exploration: *a note of caution!*

For such a Bill relating to one nations right to claim ownership of space minerals to be brought before a federal legislator was to say the least '*interesting*.' The positioning of a 'then' legislative proposal which took up the pursuit of the *commercial exploitation* of space at a time when there were, and still are, clear disputes in the South China Sea can be viewed from two distinct stances (i) as being very unwise and likely to antagonize the international community; or, (ii) as a brave move, one which tests the global views on Earth and may lead to further international talks.

That said the Bill and later Act (subsequently adopted through the implantation of the U.S. Commercial Space Launch Competitiveness Act[92] - inserted at Title IV as the Space Resource Exploration and Utilization Act of 2015) did offer some needed

[91] Ricky Lee. *Law and Regulation of Commercial Mining of Minerals in Outer Space. 2012.* Springer – Sydney, Australia.
[92] HR 2262 U.S. Commercial Space Launch Competiveness Act: 11/25/2015 Became Public Law No: 114-90.

clarity. The initial Bill provided several definitions, including defining '*space resource*' - as a natural resource of any kind found in place in outer space,'[93] with the subsequent Act clarifying that,

"(A) IN GENERAL —The term 'space resource' means an abiotic resource in situ in outer space.

(B) INCLUSIONS —The term 'space resource' includes water and minerals."

Whilst the Bill 'declared' that 'any asteroid resources obtained in outer space are the property of the entity that obtained them, which shall be entitled to all property rights to them, consistent with applicable federal law and existing international obligations,' The Act clarified that,

'A United States citizen engaged in commercial recovery of an asteroid resource or a space resource under this chapter shall be entitled to any asteroid resource or space resource obtained, including to possess, own, transport, use, and sell the asteroid resource or space resource obtained in accordance with applicable law, including the international obligations of the United States.'

In this respect it would have to be stressed that international law currently does not provide for property rights from Outer Space or indeed for mining per se and it is therefore questionable the part that federal law is claiming in arguably international matters.[94] However the later Act went some way to clarifying that there was a limitation in terms of application, that is, to U.S. citizens.

Within the Bill's Legal Framework the provision was made for civil action for appropriate legal or equitable relief, however, as this is now a Federal Act the civil redress is restricted to the U.S., whereas a UN Treaty often provides a mechanism for an International hearing. However, that said, this is not consistent across all transport modes and activities, with aviation not offering the same means of redress, as arguably is available to sea farers. Disagreements appertaining to the seabed for instance can be heard through the Seabed Disputes Chamber of the International Tribunal for the Law of the Sea (ITLOS). Article 191 of the Convention provides that,

'*The Seabed Disputes Chamber shall give advisory opinions at the request of the Assembly or the Council on legal questions arising within the scope of their activities. Such opinions shall be given as a matter of urgency.*'

Arguably, there is the requirement in international law for this type of hearing, which provides opinions and interpretation in all areas of potential conflict – that said, there is very little means to ensure enforcement or intervention, and there remains inconsistency in terms of signatories and ratification of each Treaty and Convention which further reduces the effectiveness of such global mechanisms.

The SREU Act highlights the drive by a number of private entities that are investing in, and developing the technical capability to explore and utilize outer space resources. Arguably, the OST and MA provides guidance and direction in this respect, albeit, from an international perspective. However, it should be recalled that the U.S. is not a party or signatory to the MA, having not *liked* the approach being taken in terms of 'not' providing the opportunity for commercial exploitation.

[93] Ibid. Sec. 51301. Definitions.
[94] Sect. 51303. Legal framework.

The SREU Bill emphasized the fact that '*Stakeholders*' were said to be concerned that 'legal and regulatory uncertainties are impeding their development' and 'threaten to disrupt their continued investment and eventual activities in outer space.'[95] That said, one solution would have been the MA, or given the lack of signatories to the Agreement, some international community consensus as to 'if' and 'how' mining should be developed and organized in Outer Space – rather than the subsequent national legislative act.

Instead, it is stated within the initial Bill, that the intention is to address such concerns by giving effect to Outer Space Treaty rights and obligations through the establishment of a domestic legal framework. Arguably, it remains questionable as the extent the U.S. will pursue this and the questions and response from the international community. The final part of the Act does however offer a disclaimer (Sec. 403) in relation to Extraterritorial Sovereignty, whereby it is said, that '*It is the sense of Congress that by the enactment of this Act, the United States does not thereby assert sovereignty or sovereign or exclusive rights or jurisdiction over, or the ownership of, any celestial body.*' No doubt this disclaimer realizes the potentially for such international concerns and discord.
This disclaimer was originally missing from the original Bill, which calls into question just how much the U.S. is purporting (or not) that it will govern property rights of resources – this is arguably dangerous territory. For, it could lead to, or be perceived as, taking a 'degree' of ownership and sovereignty control over celestial bodies by the mere enactment of this Act. Arguably would the U.S. look to prevent other nations mining the same asteroid/celestial body as it national's were mining? In other words, could it still be, metaphorically, planting the U.S. flag on anything seen as lucrative and worthy of exploiting in the name of the U.S.A.

From a historical perspective this desire for U.S commercialization is far from unique, but it does shows a new level, where the seabed or *sky is no longer the limit.* The U.S. has debatably been rapid in adding the SREU Act to the new Space Act. An Act, by the very title, clearly shows the intention to be 'competitive' for 'commercial' purposes.

7.1. Background to the Act
In February 2013 a hearing was heard before the Subcommittee on Space in relation to 'A Review of the Space Leadership Preservation Act.' Likewise, the name of the hearing conjures up a race for leadership and control of space, and is reminiscent of the same wording used during the1960 space race. In the proceeding 14 months, several further meetings were held and momentum gained as to future action needed in order to advance national interests. On 29 April 2014, the Committee on Science, Space, and Technology met to consider H.R. 4412, the National Aeronautics and Space Administration Authorization Act of 2014 and identified barriers to the commercial development of Space, as viewed by the U.S.
Four Bills were subsequently proposed,[96]

[95] HR 1508 - Space Resource Exploration and Utilization Act of 2015 (Purpose and summary – need for legislation).
[96] The Committee on Science, Space, and Technology. 13, May 2015.

(i) H.R. 2262, the Spurring Private
Aerospace Competitiveness and Entrepreneurship Act of 2015;
(ii) H.R. 1508, the Space Resource Exploration and Utilization Act of 2015;
(iii) H.R. 2261, the Commercial Remote Sensing Act of 2015;
and
(iv) H.R. 2263, the Office of Space Commerce Act of 2015.

All four bills went onto pass the Committee stage.

The U.S. stated equally at this time that it was not claiming sovereignty over outer space or any celestial bodies but was in fact proposing to act within conformity of the OTS of which it is a contracting state. The U.S. defended this by saying that exploration and use of outer space includes the right to remove, take possession, and use in-situ, natural resources from celestial bodies. The U.S. justifies this stance through reference to a 1979 letter,[97] in which the Secretary of State addressed to Senator Church, Chairman of Senate Foreign Relations Committee the legality of the above stated actions, which specifically included reference to asteroids. The U.S. contends that it was stated, that this was permitted under the terms of the following cited sentence, 'Outer Space, including the Moon and other celestial bodies, shall be free for exploration and use by all States.' However, it is offered that this does not translate through to meaning the same as assuming possession of a quantity of resources mined on a large scale for commercial purposes. In other words, nowhere within the letter or OST is reference made to mining for commercial purposes and permission granted for this purpose.

In further justification, the U.S. states that it recognizes that some contracting states share the view that the non-appropriation provision of the OST precludes '***exploitation***' of celestial natural resources and the claiming of such as private property. However, the U.S. does not share this view and interprets Article's I & II of the OST as '***recognizing the right of exploitation***.'[98] This indeed is strangely phrased given that the Treaty refers within Article II to sovereignty, whilst Article III of the OST refers to States Parties carrying out activities in '*exploration* and use of outer space, including the moon and other celestial bodies in accordance with international law….' The use of the word 'exploitation' is never used within Articles I or II but, potentially the recognition by the U.S. of this purpose is revealing to say the least, especially when it appears within the reasons as to the justification of the then proposed act.

The U.S. adds credence to this belief by referring to the case of U.S. v. One Lucite Ball.[99] In this case the U.S. District Court (S.D. Florida) upheld the right of Honduras to assert national property ownership over 'a' Moon rock. However, it is worth identifying the scale of what were two sales, of lunar rock 'samples'. In the first instance this involved private parties and lunar dust, which was sold at Sotheby's auction; and in this second instance this involved the lunar sample and a plaque given by the U.S. to Nicaragua which was purchased by a private buyer from the middle

[97] Dated, 28 November 1979.
[98] As within accompanying notes for the proposed Bill.
[99] Unpublished Case No. 01-0116-CIV-JORDAN.

east. Whilst property rights might have been asserted the volume of the sales does not translate to commercial mining on the scale that the Bill is inevitably proposing. And arguably depending on the nature of the plaque the U.S. likewise could have assumed ownership by giving the items(s) to Nicaragua and not retaining the samples for mankind. This in essence seems a weak argument for justifying exploitation of celestial bodies and extracting mineral on a commercial basis.

However, in a slightly more reserved manner the accompanying notes of the SREU Bill added the caveat that 'Section 51302(b) directs the President to report to Congress as to whether existing regulatory authorities are necessary to meet the international obligations of the United States with respect to the exploration and utilization of space resources.' This again is an interesting point and presents a similar scenario to UNCLOS, whereby the U.S. signed the Treaty but never ratified it, although claiming to adhere to the Treaty, whilst relying on customary international law. The OST is more vague than the MA, which nations, including the U.S. have clearly interpreted as stifling the opportunity for commercial exploration (and arguably exploitation) – it would be interesting to know the U.S.'s interpretation as to adherence to the Moon Agreement and where it interprets customary international law. During the reasoning presented for the H.R. 1508, the Space Resource Exploration and Utilization Act, the U.S. lay noticeably silent in terms of mention even the existence of the MA.

The SREU Act is now to be found contained in the last Title of the Act (US Space Act) that has the intention to,

> *'facilitate a pro-growth environment for the developing commercial space industry by encouraging private sector investment and creating more stable and predictable regulatory conditions, and for other purposes.*'

The reference to 'for other purposes' has to be construed as inevitable exploration of space minerals and the intention of commercialization of such operations. In summary, the final U.S. Commercial Space Launch Competitiveness Act is comprised of the earlier cited four Bills.[100] In respect to the SREU there was some amendments to the originals Bill's intention with slight amendment to the wording found in the final Act, namely, to 'facilitate the commercial exploration and utilization of space resources to meet national needs;' was amended to,

Section 51302, '(1) facilitate commercial exploration for and commercial recovery of space resources by United States citizens.'

The noticeably difference here is the clear direction and application to US citizens. The actual defining and interpretation of 'recovery' is arguably looser – but, there, is of course, the implication that to recover something implies a sense of ownership in the first place.

Part (2) was initially phrased so as to,

'discourage government barriers to the development of economically viable, safe, and stable industries for the exploration and utilization of space resources in manners consistent with the existing international obligations of the United States.'

And only minor amendment occurred in the final Act with the emphasis again to the U.S. and reinforcement of the intention to undertake commercial exploration and commercial recovery, namely to,

[100] As at 6.1.

'discourage government barriers to the development in the United States of economically viable, safe, and stable industries for commercial exploration for and commercial recovery of space resources in manners consistent with the international obligations of the United States.'

The reference to the manner consistent with the international obligations is perhaps the most contentious section, and one where internationally, nations may raise concerns as to what an individual state is actually able to do – much in the same way as has occurred in respect to the seabed.

The final part again places the rights and entitlements back on to U.S. citizens away from the U.S. as a State and in this way there is less emphasis to a controlling nation. That said, there is perhaps more emphasis to the commercial exploration in the final Act than occurred in the Bill, whilst the word utilization is noticeably absent in the final version – this perhaps showing a clever retreat from the fact that the exploration is to result in an 'acquirement' and 'utilization' which would emphasize that a space resource was being used and treated as acquired property.

Note the subtle change in the wording, from the Bill, at (3), to

> 'promote the right of U.S. commercial entities to explore outer space and utilize space resources, in accordance with such obligations, free from harmful interference, and to transfer or sell such resources,' to the Act, whereby it is rephrased to,
>
> 'promote the right of *United States citizens* to *engage* in *commercial exploration for and commercial recovery of space resources* free from harmful interference, in accordance with the international obligations of the United States and subject to authorization and continuing supervision by the Federal Government.'

In this regard there is also the need for a report, no later than 180 days after the date of enactment of this section, which requires the President to submit to Congress 'a report on commercial exploration for and commercial recovery of space resources by United States citizens that specifies —

(1) the authorities necessary to meet the international obligations of the United States, including authorization and continuing supervision by the Federal Government; and

(2) recommendations for the allocation of responsibilities among Federal agencies for the activities described in paragraph (1).'

In essence this should transpire half way through 2016 and at this point in time it will be interesting to see the further direction for this commercial activity and the response of the international community.

8. Conclusion

Outer Space exploration, the same as exploration of the seabed, is highly controversial, especially when it extends into the realms of mining in areas where sovereignty does not exist or is disputed.

The lessons from the sea, and the acceptance of UNCLOS and especially Title XI, serve as a clear indicator of the issues that could potentially rise in Outer Space when such exploration is pursued. In this regard, there is still the possibility that States will

try to extend their sovereignty rights from airspace and air law, higher, into outer space, or further blur unclear (non-existent) boundaries. There also remains the potential that States may try to stake a claim to celestial bodies, particularly when they have already visited or plan to visit –as in the case of the moon (and arguably Mars).

Unusually, both international law and national law (in this case the U.S.) have shown foresight in realizing the need for action and legislation from a pro-active perspective, rather than a reactive response in relation to space. However, whether this could be construed to be preventative – namely so as to minimize the difficulties and issues that have occurred in relation to the seabed, is highly debatable, particularly given the recent Federal (U.S. State) additional legislation. That said, the U.S. and the UN are approaching an identified issue from two different stances and it remains questionable as to whether either direction will meet with full or the majority of international approval. The U.S. has clearly shown previously, on two separate occasions, once in relation to UNCLOS (Part XI of UNCLOS relating to deep seabed mining outside any state's territorial waters or EEZ) and secondly the Moon Agreement – that when it does not approve it will not sign or ratify an international Treaty. In both situations, the circumstances are arguably very similar, the obvious conclusion to be drawn is that the U.S. desires to mine both the seabed and space for its own purposes and gains, taking a capitalist approach, whilst viewing the sharing of assets for the good of mankind as a communist throw back.

In respect to UNCLOS this has generated resentment from the international community as well as annoyance from within the U.S. It will only be through ratifying UNCLOS that the U.S. will join a common multilateral framework and create the possibilities of extending the realms to, perhaps, meet in the middle ground – and, achieve a compromise agreement. It is argued that only this way, would the U.S. be in a more forceful position gaining the credence to intervene and mediate in maritime disputes; and, only then will it have the potential to negotiate commercial solutions in relation to other areas that internationally are disputed.

In many ways, the SREU Act could have the desired effect of opening up new discussions in relation to outer space development and specifically mining. Critics have commented that the MA was a failure and have called into question the 'continued validity of the common heritage of mankind' theory;[101] and, certainly the lack of ratification would tend to indicate that it is an ineffective solution to a smoldering issue that will certainly ignite in coming years.

The U.S. has previously shown that it has every intention to compete in space, as occurred during the Space race with the U.S.S.R. But, the dispute in the South China Sea has shown, that as well as Russia still being a player in the space stakes, the new globalized power of China, is currently developing capabilities both in the sea and for space – so as to make sizeable gains of the assets which lie both below and above the Earth.

[101] Scott J. Shackelford. Governing the Final Frontier: A Polycentric Approach to Managing Weaponization and Debris. *American Business Law Journal.* 2014. Vol. 51, Issue 2, pp. 429-513. Daniel H. Cole. From Global to Polycentric Climate Governance. 2011. 2 Climate L. 395, pp. 412.

In the U.S. there are clear supporters for Space Resource Exploration and Utilization,[102] as well as those that see the inherent danger of taking such a stance – which blatantly pushes boundaries re ownership and sovereignty rights.
When the Bill was being presented and proposed support for commercialization was so strong that fearing for a rejection, it was even claimed that the Act would actually be unnecessary since the existing Federal Aviation Administration (FAA) licensing authorities are sufficient for these purposes. However, even the Bill negated this as a viable claim, stating that it was fervently untrue, indicating that the FAA does not have oversight over commercial activities that occur in orbit or on or around celestial bodies. In this respect there still remains a degree of uncertainty, and, in the U.S. as well as in other nations, there remains a need to provide demarcation with regards to outer space and air space. Inevitably, spacecraft (vessels) or ironically even space '*ships*' will no doubt travel more frequently through 'airspace;' and so, in this regard, it should be noted as time goes on there will be a need for further discussions, nationally and internationally, on the use and boundaries of both. It should perhaps also be noted that (as at Nov. 2015) the FAA only provides licenses for commercial launches and reentries.

Despite now passing the SREU Act alongside other Acts within the U.S. Commercial Space Launch Competitiveness Act, Professor Joanne Gabrynowicz, from the University of Mississippi and an official observer for the International Institute of Space Law to the UN Committee on the Peaceful Uses of Outer Space Legal Subcommittee, has voiced concerns as to the content (particularly referring to the initial Bill). In her letter (cited as background information to the Bill) to Ranking Member she identified that there were many ambiguities and unresolved issues that needed attention. And whilst the Bill has been passed it is questionable whether many of these matters have been resolved. In essence, the Act remains highly controversial. And whilst concerns may have been raised within the U.S. these will no doubt not be on the same scale that will arise in the international community at such a time when mining resources for clear commercial gain becomes a reality. Space lawyers have expressed serious worries about possible major repercussions; [103] whilst, Berin Szoka, head of the libertarian technology policy think tank TechFreedom, has previously issued warnings about the lack of legislation on ownership of resources extracted from the Moon, planets, comets and other bodies. [104] His argument is that without effective property rights, the vast resources available beyond Earth will benefit 'no one'. And yet, the existing UN Treaties reinforce the need to benefit all mankind and not an isolated nation, or citizens of such. That said, the U.S. has constantly showed its reluctance to adhere to such a socialist viewpoint preferring to take an imperialistic stand. Arguably, this is the essence of the Commercial Space Launch Competitiveness

[102] Ibid. Press Release, Planetary Resources, Planetary Resources, Inc. Announces Agreement with Virgin Galactic for Payload Services (July 11, 2012) *available at* http://www.planetaryresources.com/2012/07/planetary-resources-inc-announces- contract-with-virgin-galactic-for-payload-services/ (discussing the activities of Planetary Resources as the firm ramps up to begin mining asteroids).
[103] Cecilia Jamasmie. US Congress passes bill on space mining. 22 May, 2015 http://www.mining.com/us-congress-passes-bill-on-space-mining/
[104] Cecilia Jamasmie. US Congress passes bill on space mining. 22 May, 2015 http://www.mining.com/us-congress-passes-bill-on-space-mining/

Act and particularly the SREU Act – an act to benefit U.S. citizens!

It is envisaged, that like the South China Sea dispute, this will remain a volatile issue in need of resolving or agreeing (albeit compromising) from an international perspective. The irony is that, in embracing a more liberalized world with increasing opportunities for all, there is still the underlying trend of commercialization to benefit the sovereign state (or as in the SREU Act, although cited as citizens – it is arguably to be interpreted as consortiums and powerhouses of a named State). The conclusion to be drawn is that nations are beginning to stake their claim to the wealth that lies above us – much in the same way as that which lies below, with the intention to be (or remain) Earth's superpower. Even since the demise of the Cold War with Russia and the growth of China, there has been an inherent lack of achieving consensus on global issues, and this becomes more frequent when there is a financial gain to be made. Very rarely, if ever, has Earth united to benefit all mankind and until such time as an UN '*Earth flag*' is planted as a symbol of unity, such disputes are inevitably set to continue.

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